



(51) International Patent Classification:

C07D 471/14 (2006.01) A61K 31/4375 (2006.01)
C07D 487/14 (2006.01) A61K 31/519 (2006.01)
C07D 403/04 (2006.01) A61K 31/4985 (2006.01)
C07D 403/14 (2006.01) A61K 31/5025 (2006.01)

(21) International Application Number:

PCT/US2016/020418

(22) International Filing Date:

2 March 2016 (02.03.2016)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

62/128,208 4 March 2015 (04.03.2015) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG,

MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available):

ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))
- of inventorship (Rule 4.17(iv))

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:

3 November 2016

(54) Title: NOVEL COMPOSITIONS, USES AND METHODS FOR MAKING THEM

(57) Abstract: Generally, the present invention provides novel quinolone compounds and pharmaceutical composition thereof which may inhibit cell proliferation and/or induce cell apoptosis. The present invention also provides methods of preparing such compounds and compositions, and methods of making and using the same.



Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: 22-23
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 22-23 pertain to methods for treatment of the human body by surgery or therapy, and thus relate to a subject matter which this International Searching Authority is not required to search (PCT Article 17(2)(a)(i) and PCT Rule 39.1(iv)).
2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Group I, claims 1-2, 15 (all partial); and 3-14, related to a compound of Formula II(A) which refers to the 1st heterocyclic ring containing one nitrogen atom (wherein Z1 is N).

Group II, claims 1-2, 15 (all partial), related to a compound of Formula II(E) which refers to the 1st heterocyclic ring containing one nitrogen atom (wherein Z3 is N).

Group III, claims 1-2 (all partial); and 17-18, related to a compound of Formula II(B), II(C), II(D) which refers to the 1st heterocyclic ring containing two nitrogen atoms.

Group IV, claims 19-21, related to a compound of Formula VII which refers to the 1st heterocyclic ring fused with ring B.

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of any additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

A. CLASSIFICATION OF SUBJECT MATTER

C07D 471/14(2006.01)i, C07D 487/14(2006.01)i, C07D 403/04(2006.01)i, C07D 403/14(2006.01)i, A61K 31/4375(2006.01)i, A61K 31/519(2006.01)i, A61K 31/4985(2006.01)i, A61K 31/5025(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

C07D 471/14; C07D 513/04; C07D 487/14; C07D 487/04; A61K 31/4353; C07D 403/04; C07D 403/14; A61K 31/4375; A61K 31/519; A61K 31/4985; A61K 31/5025

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal), STN(Registry, Caplus), Google & Keywords: imidazo, pyrido, pyrazine, cancer, cell proliferation, cell apoptosis, POL 1 transcription

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Chemical Abstract compounds, STN express RN 183858-24-4 (Entered STN: 11 December 1996), RN 183858-23-3 (Entered STN: 11 December 1996). See the structures.	1-2
A		3-15, 17-21
X	Chemical Abstract compounds, STN express RN 93438-49-4 (Entered STN: 18 December 1984). See the structure.	1-2
A		3-15, 17-21
X	ZANZOUL, A. et al., "A benzimidazopyridoquinoxaline as promising scaffold for G-quadruplex DNA targeting", Medicinal chemistry research, 2014, Vol.23, pages 4042-4049. See abstract; page 4042; scheme 1.	19-20
A		1-15, 17-18, 21
X	ANDALOUSSI, M. et al., "Novel imidazo[1,2-a]naphthyridinic systems (Part 1): Synthesis, antiproliferative and DNA-intercalating activities", Eur. J. Med. Chem., 2008, Vol.43, pages 2505-2517. See abstract; table 1.	19

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

30 August 2016 (30.08.2016)

Date of mailing of the international search report

30 August 2016 (30.08.2016)

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2016/020418

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02-28860 A2 (BRISTOL-MYERS SQUIBB COMPANY) 11 April 2002 See abstract; pages 25-26, 34, 46.	19
A	MOGILAI AH, K. et al., "Synthesis of some novel bridgehead nitrogen heterocyclic systems containing 1,8-naphthyridine moiety", Indian J. Chem., 2003, Vol. 42B, pages 192-194. See scheme 1, compound 5.	1-15, 17-21
PX	WO 2015-172123 A1 (HADDACH, MUSTAPHA) 12 November 2015 See abstract; claims 1-33.	1-15, 17-21

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2016/020418

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 02-28860 A2	11/04/2002	AT 319713 T	15/03/2006
		AU 1182702 A	15/04/2002
		AU 2002-211827 B2	14/12/2006
		CA 2424303 A1	11/04/2002
		DE 60117835 T2	19/10/2006
		EP 1325009 A2	09/07/2003
		EP 1325009 B1	08/03/2006
		ES 2260300 T3	01/11/2006
		HU 0302925 A2	29/12/2003
		HU 0302925 A3	28/10/2004
		JP 2004-512281 A	22/04/2004
		JP 5021148 B2	05/09/2012
		US 2002-0072523 A1	13/06/2002
		US 6960585 B2	01/11/2005
		WO 02-028860 A3	06/09/2002
		WO 2015-172123 A1	12/11/2015